NORTH ATLANTIC STORMS FOR NOVEMBER, 1890 (pressure in inches and millimetres; wind-force by Beaufort scale).

The paths of the storms that appeared over the north Atlantic Ocean during November, 1890, are shown on chart I. These paths have been determined from international observations by captains of ocean steamships and sailing vessels received through the co-operation of the Hydrographic Office, Navy Department, and the "New York Herald Weather Service."

Twelve storms have been traced for November, 1890, the average number for the corresponding month of the last 8 years being 10.4. Of the storms traced for the current month 8 were continuations of areas of low pressure which moved eastward from the American continent; one appeared over the ocean in high latitudes; one was central southeast of Nova Scotia on the 1st; one first appeared in the vicinity of Bermuda; and one advanced northeastward from southern Florida. Exceptionally severe weather prevailed along the trans-Atlantic routes during a greater part of the month.

During the last 17 years but 3 storms of pronounced strength advanced northward from the West Indies in November. In 1879 a West India cyclone, first located over the southeastern Bahamas, moved rapidly northward and northeastward, passing Cape Hatteras the night of the 19th, and Halifax, N. S., the afternoon of the 20th, and thence moved northeastward over the Gulf of Saint Lawrence or Newfoundland. Furious gales, attaining hurricane force at sea, attended the passage of this storm. On the 29th and 30th, 1887, the path of a storm was approximately located north of the West Indies, and from the 28th to 30th heavy gales, attaining hurricane force, were encountered in that region. In 1888 a storm was first located northeast of the Windward Islands under date of the 17th, whence it moved westward to the Bahamas by the 22d, where it recurved to the northward, and moved north-northeast to eastern New England by the 28th. This storm was attended by very destructive gales off the coast of the United States from the 21st to 27th. Among the more notable storms whose influence has been severely felt off the American coast are: a storm in 1873, which developed over north Georgia on the 16th, passed off the North Carolina coast on the 17th, and over the Bay of Fundy into the Gulf of Saint Lawrence during the 18th, attended by fierce gales and fearful seas. At Norfolk, Va., the barometer fell to 28.86 (733) on the 17th. In Chesapeake Bay the storm was extremely severe. At Cape May, N. J., the barometer fell to 28.76 (730), and the gales off the coast were reported the severest in years. On the 18th the barometer fell to 28.72 (729) at New Haven, Conn.; at Wood's Holl, Mass., to 28.60 (726); at Boston, Mass., to 28.61 (727); and at Portland, Me., to 28.49 (724). The storm was also very severe over the Canadian Maritime Provinces, and was attended throughout by heavy rain or snow. In 1877, during the night of the 23d–24th, when a storm which had advanced from the north Pacific coast was central in West Virginia, the U. S. S. "Huron" was wrecked on the North Carolina coast 50 miles north of Cape Hatteras. A southeasterly wind was blowing, with a heavy southeast swell, at the scene of the disaster.

In November, 1890, a storm was central southeast of Nova Scotia on the 1st, with pressure about 29.40 (747) and fresh to strong gales. A storm was also central on this date over mid-ocean in high latitudes, with pressure falling to about 29.40 (747). By the 2d the storm first referred to had moved northeast of the Grand Banks attended by strong gales, and the storm over mid-ocean on the 1st had moved to the north of Scotland, and pressure falling to 28.82 (732) was reported at Leith. On the 3d the storm over the ocean had advanced to high latitudes and stormy weather prevailed over the west parts of the British Isles. A storm, central over the Gulf of Saint Lawrence on this date, moved east-northeast over north Newfoundland by the 4th, to about the 30th meridian by the 5th, to west of the British Isles by the 6th, and thence over north Scotland by the 7th, with pressure falling to 28.67 (728) at Leith on the last named date. On the 7th heavy storms prevailed throughout Great Britain and Ireland, causing the loss of a number of coasting vessels. During the 8th and 9th a storm was central north of Ireland, with pressure about 29.20 (742). On the 9th a storm which had advanced from the Gulf of Saint Lawrence was central northeast of the Grand Banks, with pressure about 29.30 (744), whence it passed rapidly eastward to about the 17th meridian by the 10th, with pressure about 29.00 (737) and heavy gales, after which it recurved to the northward with a slight increase in central pressure, and after the 11th apparently united with a storm which had advanced from the Gulf of Saint Lawrence to about the 22d meridian during the 10th, 11th, and 12th, attended by violent gales and pressure falling below 29.00 (737) on the 11th and 12th, after which it disappeared north of the region of observation. During the 13th, 14th, and 15th low pressure and gales continued over mid-ocean. On the 15th a storm was central northeast of the Grand Banks, to which position it had advanced from the Gulf of Saint Lawrence. By the 17th this storm had moved slowly south of east to the 34th meridian, with pressure about 29.30 (744) and fresh to strong gales, after which it recurved north and west and apparently united with a storm which advanced from the southwest. On the 18th a storm was central south of Nova Scotia, with pressure about 29.20 (742), whence it moved rapidly to northeast of the Grand Banks by the 19th, where the pressure fell to about 28.70 (729) and heavy storms prevailed, after which it disappeared north of the region of observation. On the 20th a storm was central south of Nova Scotia, with pressure about 29.40 (747), whence it passed to northeast of Newfoundland by the 21st, after which it disappeared north of the region of observation. On the 23d a storm was central north of the Gulf of Saint Lawrence, whence it moved to north of Newfoundland by the 24th, after which it disappeared north of the region of observation. On the 23d and 24th a violent gale prevailed over Great Britain, and a number of wrecks and collisions was reported. During the 26th and 27th a storm passed north of east north of the Gulf of Saint Lawrence and Newfoundland. On the 28th a storm of considerable strength appeared north of Bermuda, whence it moved northeastward to south of Newfoundland by the 29th. On this date a heavy northeast gale and high tides prevailed along the east coast of Newfoundland, and the pressure fell to 28.45 (723) at Saint John's at 5 p. m. Reports from other points in Newfoundland show great damage to shipping interests. By the 30th this storm had advanced northeastward to about the 40th meridian without an appreciable loss of energy. On the morning of the 29th a storm appeared over the southern extremity of Florida, whence it moved northeastward and on the morning of the 30th was central about midway between Bermuda and the south Atlantic coast. On the night of the 30th a heavy southeast gale prevailed over Bermuda. Houses were unroofed and a great amount of damage caused to other property and crops. The storm was also very severe over the ocean between Bermuda and the south Atlantic coast.

OCEAN ICE IN NOVEMBER.

The only Arctic ice reported for November, 1890, was a small piece of ice in N. 46° 35′, W. 47° 51′ on the 16th.

In November, 1882, 1883, 1887, and 1888, no Arctic ice was reported near Newfoundland or the Grand Banks. In 1884 several icebergs were seen in N. 45° 56′, W. 52° 38′. In 1885 the only iceberg reported was observed in N. 48° 00′, W. 51° 10′. In 1886 one iceberg was reported in N. 45° 20′, W. 45° 26′.

FOG IN NOVEMBER.

The limits of fog-belts west of the 40th meridian, as determined from reports of shipmasters, are shown on chart I by dotted shading. Near the Banks of Newfoundland fog was reported on 10 dates; between the 55th and 65th meridians on 1 date; and west of the 65th meridian on 2 dates. Compared with the corresponding month of the last 3 years the

dates of occurrence of fog near the Grand Banks numbered 2 less than the average; between the 55th and 65th meridians 3 less than the average; and west of the 65th meridian 6 less than the average. On the dates fog was reported east of the 65th meridian it occurred with the approach or passage to the northward of general storms. On the dates fog was reported west of the 65th meridian, the 15th and 16th, it was encountered off the New Jersey coast with rain and unsettled weather. On the 7th, 9th, 14th, 17th, and 30th, dense fog occurred at Signal Service stations on the New York and New England coasts with the advance over the Lake region or the Saint Lawrence Valley of storms whose influence extended off the coast.

TEMPERATURE OF THE AIR (expressed in degrees, Fahrenheit).

Many of the voluntary stations do not have standard thermometers or shelters.

The distribution of mean temperature over the United States and Canada for November, 1890, is exhibited on chart II by dotted isotherms. In the table of Signal Service data the monthly mean temperature and the departure from the normal are given for regular stations of the Signal Service. The figures opposite the names of the geographical districts in the columns for mean temperature and departure from the normal show, respectively, the averages for the several districts. The normal for any district may be found by adding the departure to the current mean when the departure is below the normal and subtracting when above. The monthly mean temperature for regular stations of the Signal Service represents the mean of the maximum and minimum temperatures.

The mean temperature was highest over south Florida, where it was above 70, and the mean values were above 60 on the South Carolina and Georgia coasts, along the Gulf coast, in the lower Gila valley, in the Colorado Valley from extreme south Nevada southward, and generally in California south of the 34th parallel. The mean temperature was lowest in extreme north Ontario, and at elevated stations in west-central Colorado, where it was below 25, and the mean readings were below 30 in the lower Saint Lawrence valley, north Maine, north Ontario, at extreme northern upper lake stations, in north Minnesota and northeast North Dakota, in the British Possessions north of North Dakota, and from central Wyoming southward over west-central Colorado. The mean temperature was below 40 north of a line traced from south New England westward to central Colorado, thence southward to central New Mexico, thence irregularly northwestward to west-central Nevada, and east of this line continued northward over Oregon and Washington.

The mean temperature was above the normal except from Lakes Ontario and Huron eastward over New England and the Saint Lawrence Valley, in extreme south Florida, and in extreme southeast Arizona. The greatest departure above the normal temperature was noted in north North Dakota and Montana and the British Possessions to the northward, where it exceeded 10, and the departure above the normal exceeded 6 in the upper Missouri and Red River of the North valleys, at stations in Tennessee and the east Gulf states, in the Sacramento Valley, and on the south Pacific coast. In districts where the mean temperature was below the normal the departure was less than 2.0, save at Albany, N. Y., and Portland, Me., where it was 2.6 and 2.1, respectively.

At stations in the Atlantic coast states between the 30th and 40th parallels, in the east Gulf states, the lower and middle Mississippi and Ohio valleys, on Lake Erie, in the middle and upper Missouri and Red River of the North valleys, and on the middle and south Pacific coasts the current month was the warmest November in the history of the Signal Service. In the middle and south Atlantic and east Gulf states the mean temperature was 0.5 to 4.0 higher than previously reported for November; in the lower Mississippi valley 0.2 to 2.6 higher; in the Ohio Valley 0.5 to 1.6 higher; in the middle Mississippi valley 0.1 to 0.2 higher; in the Missouri Valley 0.4 to 1.8 higher; and on the middle and south Pacific coasts 0.4 to 4.1 higher. In November of preceding years the highest mean temperature occurred over the middle and northern plateau regions and on the northeast slope of the Rocky Mountains in 1885; in the interior of the south Atlantic states in 1883; along the middle and south Atlantic coasts in 1881; from Texas northeastward to the middle Ohio valley in 1879; from the northeast and middle-eastern slopes of the Rocky Mountains eastward over the upper lakes, and over north California in 1878; in Oregon in 1877; and in the east Gulf states in 1875.

The coolest November in the history of the Signal Service occurred in North and South Carolina and over the entire country west of the Rocky Mountains, save in Arizona and California south of the 40th parallel, in 1880, when the departures above the normal varied from 2 to 10 in the lower Mississippi valley and in the Gulf states; from 5 to 11 in the middle and upper Mississippi and Ohio valleys and the Lake region; 5 to 10 in the Missouri Valley; from 6 to 15 in the middle plateau region and on the middle-eastern slope of the Rocky Mountains, and from 3 to 6 on the middle and north Pacific coasts. The coldest November noted in New England, New York, and Pennsylvania occurred in 1873, when the mean was 5 to 9 below the normal; and from north Florida and east Georgia northward over east Tennessee, and thence eastward over south Virginia in 1872, when the mean was 4 to 6 below the normal.

DEVIATIONS FROM NORMAL TEMPERATURE.

The following table shows for certain stations, as reported by voluntary observers, (1) the normal temperature for November for a series of years; (2) the length of record during which the observations have been taken, and from which the normal has been computed; (3) the mean temperature for November, 1890; (4) the departure of the current month from the normal; (5) and the extreme monthly mean for November, during the period of observation and the years of occurrence:

State and station.	County.	(1) Normal for the month of Nov.	(2) Length of record.	(3) Mean for Nov., 1890.	(4) Departure from normal.	(5) Extreme monthly mean for Nov.			
						Highest.	Year.	Lowest.	Year.
Arkansas.		°	*Years*	°	°	°		°	
Lead Hill	Boone	46.9	9	51.2	+ 4.3	51.2	1890	44.1	1889
California.									
Sacramento	Sacramento	52.6	37	44.9	− 7.7	57.5	1873	44.9	1890
Connecticut.									
Middletown	Middlesex	39.4	24	39.5	+ 0.1	45.1	1859	31.6	1873
Florida.									
Merritt's Island	Brevard	67.6	8	71.3	+ 3.7	73.3	1883	60.0	1885
Georgia.									
Forsyth	Monroe	56.1	15	61.7	+ 5.6	61.7	1890, '74	51.0	1880
Illinois.									
Peoria	Peoria	39.6	34	44.2	+ 4.6	44.6	1867	30.2	1880
Riley	McHenry	33.6	34	38.4	+ 4.8	40.3	1865	24.1	1880
Indiana.									
Vevay	Switzerland	43.5	25	48.0	+ 4.5	48.7	1879	33.0	1869
Iowa.									
Cresco	Howard	28.5	18	33.6	+ 5.1	34.7	1878	19.2	1880
Monticello	Jones	33.5	35	37.5	+ 4.0	41.5	1859	24.4	1863
Logan	Harrison	35.8	16	41.9	+ 6.1	41.9	1890	27.5	1880
Kansas.									
Lawrence	Douglas	39.9	22	44.1	+ 4.2	45.8	1878	31.6	1880
Wellington	Sumner	41.0	11	45.2	+ 4.2	45.5	1879	29.0	1880
Louisiana.									
Grand Coteau	Saint Landry	59.4	8	60.8	+ 1.4	64.0	1883	56.2	1889
Maine.									
Orono	Penobscot	33.8	20	34.7	+ 0.9	38.6	1889	27.1	1875
Maryland.									
Cumberland	Allegany	39.9	31	44.3	+ 4.4	44.7	1883	32.7	1869
Massachusetts.									
Amherst	Hampshire	38.3	54	37.6	− 0.7	44.1	1849	29.7	1873
Newburyport	Essex	39.8	12	39.0	− 0.8	42.1	1889	36.5	1880
Somerset	Bristol	40.6	18	42.5	+ 1.9	45.2	1889	33.0	1873